Part D Coverage Gap and Adherence to Diabetes Medications

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Objective: To evaluate the impact of Medicare Part D coverage gap (donut hole) on adherence to diabetes medications.

Study Design: Retrospective cohort analysis based on pharmacy claims data.

Methods: The sample included 12,881 Medicare Part D beneficiaries with diabetes who entered the coverage gap in 2008. Sample patients had 3 different levels of coverage in the donut hole: no coverage, generic drug coverage only, and both generic and brand-name drug coverage. Adherence was measured by the proportion of days covered. We used a difference-in-difference model to evaluate the effect of coverage gap on adherence.

Results: In the donut hole, the average copayment for diabetes medications increased substantially for beneficiaries with no coverage and beneficiaries with generic drug coverage only, whereas the average copayment for beneficiaries with both generic and brand-name medication coverage declined slightly. Compared with beneficiaries with full coverage of both generic and brand-name drugs, beneficiaries with no coverage (odds ratio [OR] = 0.617, P <.0001, 95% confidence interval [CI] = 0.523, 0.728) and beneficiaries with generic drug coverage only (OR = 0.702, P <.0001, 95% CI = 0.604, 0.816) were significantly less likely to be adherent after entering the donut hole. The difference between having generic coverage and no coverage was not significant (P = .1586).

Conclusions: The coverage gap in the Medicare Part D program has a significant negative impact on medication adherence among beneficiaries with diabetes. Availability of brand-name drug coverage in the donut hole is critical to adherence to diabetes medications.

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For author information and disclosures, see end of text.

The Medicare Part D program, introduced on January 1, 2006, provides prescription drug coverage for Medicare beneficiaries. One unique feature of the Part D benefit design is the coverage gap (or donut hole). The defined standard benefit in 2008 started with a $275 deductible and a 25% copayment for drug spending between $275 and $2510. After the initial coverage period, beneficiaries entered a coverage gap, in which they paid 100% of the drug cost, until their true out-of-pocket drug spending reached the catastrophic limit of $4050 (or total drug spending of $5726.25). Under the catastrophic coverage, beneficiaries pay the greater of a 5% or a $2.25/$5.60 (generic/brand-name) copayment.

The donut hole is a controversial component of the Part D design because a lack of benefit may negatively impact patients' drug utilization and subsequent clinical outcomes. Studies have shown that beneficiaries of private drug benefit plans with annual benefit limits are more likely to discontinue their medications and have a higher rate of hospitalization compared with beneficiaries who have no benefit limits.[1,2] Sun et al reported that the donut hole was associated with reductions in medications used for potentially disabling and life-threatening conditions.[3] Another study by Zhang et al indicated that beneficiaries with no coverage in the donut hole decreased their use of monthly prescriptions by about 14%.[4]

In this study, we examine the effects of the Part D coverage gap on adherence to diabetes medications. We focused on diabetes because diabetes is a serious chronic medical condition with considerable morbidity and mortality. The prevalence rate of diabetes is high among senior citizens (23.1%), compared with 7.8% in the US population.[5] In 2007, over half of the $174 billion economic cost of diabetes was attributed to people 65 years and older, and a large portion of these costs were borne by Medicare.[6]

Previous studies on the Part D coverage gap generally used the number of prescriptions filled as the outcome variable.[3,4] It is difficult to link the number of prescriptions with important outcomes such as hospitalizations and glycosylated hemoglobin (A1C) levels to help decision making in Part D benefit design. Our research focused on adherence to diabetes medications, a critical component in the management of diabetes. Aggressive glycemic management, as measured by A1C, can reduce long-term complications[7] and medical costs associ-

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Take-Away Points

The Medicare Part D coverage gap has a significant negative impact on adherence to diabetes medications.

- The average copayment of diabetes medications increased substantially for beneficiaries with no coverage or only generic coverage in the donut hole.
- Beneficiaries with no coverage or only generic coverage in the donut hole were significantly less likely to be adherent to diabetes medications in the donut hole.
- Offering only generic coverage in the donut hole has a limited impact on patients' adherence to diabetes medications.

ated with diabetes treatment.[8,9] Poor adherence to diabetes medications is a major contributor to unsatisfactory glycemic control[10-13] and increases the risk of adverse health events associated with diabetes.[14-16] Inadequate adherence to diabetes medications in the donut hole could have serious long-term consequences for both Medicare and Medicare beneficiaries.

METHODS

Data Source and Sample Selection

This study is a retrospective cohort analysis based on prescription drug claims data provided by MedImpact Healthcare Systems, Inc, a national pharmacy benefit management company. Compared with the national data, Part D beneficiaries in MedImpact had the same sex distribution but were less likely to be under age 65 years (**Table 1**).

The sample in this research included patients over age 65 years who were continuously enrolled in a Medicare Part D plan from January 1, 2007, to December 31, 2008, and had at least 2 diabetes medication claims in each year. This study required patients to use diabetes medications in 2007 to ensure that all patients had used diabetes medications prior to the study period, January 1, 2008, to December 31, 2008. Utilization data in 2007 were used to acquire comorbidity information. Patients who received low-income subsidies for their premium and copayment were excluded from the sample because of their unique benefit structure.

A total of 35,426 patients were identified using these criteria. Among these patients, 37.10% reached the donut hole in 2008 but did not reach the catastrophic limit, 13.38% reached both the donut hole and the catastrophic limit, 49.44% never reached the donut hole, and the remaining 0.09% reached the catastrophic limit directly without entering the donut hole. We selected only patients who had reached the donut hole but not the catastrophic limit for this research.[3,4] The final sample contained 12,881 patients from more than 30 different health plans.

Coverage in Donut Hole

Part D patients can have different types of Part D plans, including the defined standard benefit (DSB) plan, the actuarially equivalent (AE) plan, the basic alternative (BA) plan, and the enhanced alternative (EA) plan. The AE and BA plans are equivalent to DSB plans in value and do not provide coverage in the donut hole. The EA plans charge a supplemental premium and provide supplemental benefits. Many EA plans cover either generic drugs only or both generic and brand-name drugs as supplemental benefits.

In our analysis, we designated 3 groups of Part D beneficiaries based on their coverage in the donut hole. The first group consisted of beneficiaries with no donut hole coverage ("no coverage" group). This group included beneficiaries with DSB, AE, or BA plans and beneficiaries with EA plans that did not offer coverage in the donut hole. The second group comprised beneficiaries with only generic drug coverage in the donut hole ("generic coverage only" group) from EA plans. The third group included beneficiaries with both generic and brand-name drug coverage in the donut hole ("full coverage" group) from EA plans. All Part D plans identified in this research had $2510 and $5726.25 for the start and end of the donut hole.

Variables

The outcome measure of interest was adherence to diabetes medications. In this analysis, adherence to diabetes medications was measured by the proportion of days covered (PDC), calculated as the number of days covered by at least 1 diabetes medication in a certain period of time, divided by the number of days in that period. To calculate a PDC, each day in that period was evaluated as covered or as not covered by a medication based on fill date and days of supply. If a new claim for the same diabetes medication occurred before the end date of the last claim, the starting date of the new claim was pushed forward to the end date of the last claim. We calculated 2 PDCs for each patient: one for the period before reaching the coverage gap (pregap PDC) and the other for the period after reaching the coverage gap (postgap PDC). Patients with a PDC of 80% or more were classified as adherent.[10,14-18] In addition to a dichotomous adherence variable, we used continuous PDC as the outcome variable to test the robustness of the results.

Control variables include age, sex, whether patient used insulin in the prior 12 months, geographic region (Northeast, South, Midwest, and West), and comorbidities in the prior 12 months. Comorbidity indicators were constructed based on the RxRisk model of comorbid conditions.[19] A series of dummy variables for each major comorbid condition were created for the analysis.

Modeling Approach

We used a difference-in-difference regression analysis to measure the effect of coverage gap on adherence to diabetes medications. The difference-in-difference method used patients with full coverage in the donut hole as the control group because these patients experienced little copayment change in the donut hole. The experimental group consisted of patients in the other 2 groups (no coverage and generic coverage only), who experienced substantial copayment increases in the donut hole.

Two challenges in measuring the effect of the donut hole are that (1) patients may self-select different levels of coverage and (2) they may have different propensities for being adherent to diabetes medications. The difference-in-difference method addresses this issue by having repeated observations for the same patient in both the pregap period and postgap periods. A group fixed effect was used to control for the permanent differences across different groups, and a time fixed effect was used to control for the secular trend within the study period. The true donut hole effect is the difference in adherence to diabetes medications between the control and the experimental groups in the donut hole, adjusting for the difference between the control and the experimental groups before entering the donut hole.

RESULTS

Descriptive Analysis

Table 2 presents the patients' characteristics. The average age for the entire sample was 74.97 years, and 48.06% of patients in the sample were male. A typical patient spent around 104 days in the donut hole. The vast majority of patients in the sample lived in the Midwest (82.85%). The most significant comorbidities were hypertension (87.41%), hyperlipidemia (81.54%), and heart disease/hypertension (69.47%).

About a third (33.47%) of patients used insulin in the prior 12 months. Among patients who used insulin in 2007, the percentages using short-acting, intermediate-acting, long-acting, and mixed insulin were 32.27%, 25.68%, 55.56%, and 27.67%, respectively. These categories are not mutually exclusive because a patient could have used more than 1 type of insulin in 2007.

In the sample, 19.63% of the 12,881 beneficiaries had no coverage in the donut hole, 20.08% of beneficiaries were covered for generic drugs only, and 54.28% of beneficiaries had full coverage. Patients with no coverage in the donut hole were slightly older (75.40 years) than patients with generic coverage only (74.85 years) and patients with full coverage (74.87 years). Patients with generic coverage only had the longest stay in the donut hole (107.96 days), and patients with no coverage in the donut hole spent the shortest time in the donut hole (99.91 days); patients with full coverage fell in between (103.54 days).

Table 1. Age and Sex Distribution of MedImpact Part D Beneficiaries Compared With National Part D Beneficiaries in 2008[a]

Characteristic	National Part D Beneficiaries, %	MedImpact Part D Beneficiaries, %
Age group, y		
<65	23	10
65-69	21	28
70-74	18	21
75-79	15	18
≥80	23	24
Sex		
Female	59	59
Male	41	41

[a]National data are from page 180 of *A Data Book: Healthcare Spending and the Part D Program* by the Medicare Payment Advisory Commission, published in June 2010. The MedImpact data are based on the authors' calculation.

Table 3 shows the adherence rates and average copayments for patients in the sample. The adherence rate before reaching the donut hole for the no-coverage group was 0.82, which was close to the adherence rates of 0.81 for the group with generic coverage only and 0.85 for the group with full coverage. After reaching the donut hole, the adherence rate of patients with no coverage dropped 8 percentage points to 0.74. Similarly, the adherence rate of patients with generic coverage dropped 6 percentage points to 0.75. In contrast, patients with full coverage maintained their adherence rate at 0.85 in the donut hole.

The coverage gap had a substantial impact on copayment. The average copayment (per 30 days of supply, the same thereafter) of all diabetes medications before reaching the donut hole was $18.63 for patients with no coverage, $18.63 for patients with generic coverage only, and $16.48 for patients with full coverage. After reaching the donut hole, the average copayment increased to $69.20 (a 271% increase) for the group with no coverage and to $67.18 (a 261% increase) for the group with generic coverage only. Partially because of the increased use of 90 days of supply, the average copayment for patients with full drug coverage actually decreased slightly to $14.33 after reaching the donut hole.

Table 3 breaks down the change in average copayment by generic and brand-name diabetes medications. For patients with no coverage, the average copayment for generic drugs almost doubled after reaching the donut hole ($12.13 vs $6.42). In contrast, the average copayment for generic drugs

Table 2. Descriptive Analysis of Patient Characteristics

Characteristic	All Patients (N = 12,881)	No Donut Hole Coverage (n = 2529)	Generic Drug Coverage Only (n = 3360)	Full Coverage (n = 6992)
Age, y (SD)	74.97 (6.54)	75.40 (6.98)	74.85 (6.62)	74.87 (6.32)
Days in donut hole (SD)	103.98 (61.94)	99.91 (61.22)	107.96 (64.14)	103.54 (61.02)
Male, %	48.06	44.09	47.11	49.96
Ever used insulin in 2007, %	33.47	39.50	37.74	29.23
Region of residence, %				
Midwest	82.85	75.56	81.28	86.24
Northeast	4.65	1.19	12.62	2.07
South	5.39	6.52	1.49	6.85
West	7.11	16.73	4.61	4.83
RxRisk comorbidity groups, %				
Anxiety and tension	16.81	10.52	17.44	18.78
Cardiac disease	9.54	9.53	10.09	9.28
Coronary/peripheral vascular disease	30.75	30.88	34.29	29.00
Cystic fibrosis	12.41	13.88	13.24	11.47
Depression	23.12	24.67	25.45	21.44
Epilepsy	12.58	11.94	13.07	12.57
Gastric acid disorder	30.24	26.77	28.96	32.11
Glaucoma	11.26	11.31	11.07	11.33
Heart disease/ hypertension	69.47	69.16	71.46	68.62
Hyperlipidemia	81.54	81.69	78.18	83.09
Hypertension	87.41	88.34	87.71	86.93
Irritable bowel syndrome	11.75	12.22	12.98	10.98
Malignancies	7.41	6.25	8.54	7.28
Thyroid disorder	22.23	21.47	24.08	21.61

did not change for patients with generic coverage only ($6.64 vs $6.52) and even decreased from $6.37 to $4.63 for patients with full coverage. The average copayment for brand-name drugs quadrupled after reaching the donut hole for patients with no coverage ($126.05 vs $31.79) and patients with generic coverage only ($133.34 vs $32.47).

Table 4 presents the changes in the market share by diabetes medication classes before and in the donut hole. Market share was defined as the sum of days of supply in each class of diabetes medications divided by the sum of days of supply for all diabetes medications. Overall, the market shares of different diabetes medications changed little before and in the donut hole. There was no evidence that patients with no brand-name drug coverage tried to increase the use of generic drugs in response to increases in copayment for brand-name drugs in the donut hole. In fact, the market share of insulin and dipeptidyl peptidase-4 inhibitors, 2 classes of medications dominated by brand-name medications, increased in the donut hole for patients in all 3 groups.

Difference-in-Difference Regression Analysis

We conducted a multivariable logistic regression to evaluate the probability of adherence to diabetes medications, defined by a dummy PDC greater than or equal to 0.8. Table 5 indicates that age, sex, and use of insulin in the prior 12 months all contributed to adherence to diabetes medications. Men were more likely to adhere than women (odds ratio [OR] = 1.122, P = .001). Compared with patients aged 65 to 74 years, those

Table 3. Adherence and Copayment Before and After Reaching the Donut Hole

Copayment and Adherence	All Patients (N = 12,881)	No Donut Hole Coverage (n = 2529)	Generic Drug Coverage Only (n = 3360)	Full Coverage (n = 6992)
Adherence rate (PDC ≥ 0.80) before donut hole	0.83 (0.37)	0.82 (0.38)	0.81 (0.39)	0.85 (0.36)
Adherence rate (PDC ≥0.80) in donut hole	0.80 (0.40)	0.74 (0.44)	0.75 (0.43)	0.85 (0.36)
PDC before donut hole	0.78 (0.20)	0.81 (0.20)	0.79 (0.21)	0.77 (0.20)
PDC in donut hole	0.74 (0.33)	0.70 (0.35)	0.70 (0.35)	0.76 (0.32)
Copayment per 30 days of supply (all antidiabetic medications) before donut hole, $	17.59 (15.98)	18.63 (16.48)	18.63 (15.22)	16.48 (16.14)
Copayment per 30 days of supply (all antidiabetic medications) in donut hole, $	38.96 (60.32)	69.20 (77.38)	67.18 (78.01)	14.33 (17.07)
Copayment per 30 days of supply (generic antidiabetic medications) before donut hole, $	6.41 (2.59)	6.42 (3.28)	6.52 (2.04)	6.37 (2.53)
Copayment per 30 days of supply (generic antidiabetic medications) in donut hole, $	6.65 (6.02)	12.13 (9.95)	6.64 (1.91)	4.63 (3.83)
Copayment per 30 days of supply (brand-name antidiabetic medications) before donut hole, $	30.47 (15.23)	31.79 (14.80)	32.47 (11.51)	28.58 (17.19)
Copayment per 30 days of supply (brand-name antidiabetic medications) in donut hole, $	71.21 (71.78)	126.05 (73.33)	133.34 (65.94)	23.65 (19.49)

PDC indicates proportion of days covered.

aged 75 to 84 years and aged ≥85 years were less likely to be adherent (OR = 0.838, P <.0001 for age 75-84; OR = 0.747, P <.0001 for age ≥85). Patients using insulin in 2007 were less likely to be adherent (OR = 0.698, P <.0001). Of the 4 regions, patients in the South were less likely to be adherent and patients in the West were more likely to be adherent compared with patients in the Midwest. The effects of most comorbidities were negative, indicating that patients' overall sickness and the number of comorbidities might negatively influence adherence to diabetes medications.

The regression model indicates that patients with no coverage in the donut hole and patients with only generic coverage in the donut hole had a 38% reduction (OR = 0.617, P <.0001, 95% confidence interval [CI] = 0.523, 0.728) and 30% reduction (OR = 0.702, P <.0001, 95% CI = 0.604, 0.816) in the odds of being adherent after reaching the donut hole, respectively, compared with patients with full coverage (Table 5). The difference between the effect of no coverage and the effect of having generic drug coverage was not statistically significant (P = .1586).

We performed a robustness analysis by using continuous PDC as the outcome variable. When the outcome variable was continuous PDC, patients with no coverage had a 9.8 percentage point drop in PDC (P <.0001, 95% CI = −11.5, −8.1), whereas patients with generic coverage had only an 8.6 percentage point drop in PDC (P <.0001, 95% CI = −10.2, −7.0) compared with patients with full coverage. The difference between no coverage and generic coverage only also was statistically insignificant (P = .2449).

DISCUSSION

This research shows that the donut hole had a large impact on patients' copayments. After reaching the donut hole, the average copayment for diabetes medications increased substantially for patients with no coverage and patients with generic drug coverage only. Corresponding to the copayment increase, adherence to diabetes medications in the donut hole dropped substantially for patients in both groups.

The decrease in adherence to diabetes medications should be of concern for policy makers and healthcare providers. Diabetes is a highly prevalent disease among senior citizens. In 2005, it was estimated that 3.40 million people aged 65 to 74 years and 2.88 million people 75 years and older in the United States had diabetes.[20] By 2050 in the United States, the number of patients with diabetes aged 65 to 74 years is projected to increase by 220% to 10.88 million, and the number of patients with diabetes 75 years and older is projected to increase by 449% to 15.81 million.[20] A decrease in adherence to diabetes medications could have serious long-term consequences for morbidity, mortality, and healthcare costs.[5,6,12-16]

This research also showed that offering only generic coverage in the donut hole may have a limited impact on improving patients' adherence to diabetes medications. Compared with patients with no coverage, patients with generic drug coverage had higher adherence levels, but the difference was not statistically significant. The availability of brand-name drug coverage in the donut hole is important to maintain

Table 4. Drug Class Market Share[a] Before and After Reaching the Donut Hole

	No Donut Hole Coverage, %		Generic Coverage in Donut Hole Only, %		Full Coverage, %	
Drug Class	Before Donut Hole	In Donut Hole	Before Donut Hole	In Donut Hole	Before Donut Hole	In Donut Hole
Insulin	28.04	28.68	23.26	25.21	17.61	19.85
Sulfonylurea	27.96	28.72	29.21	29.37	28.70	26.44
Metformin	26.73	25.26	28.43	28.25	29.02	25.31
TZD	9.97	10.05	11.28	9.36	15.88	17.98
Amylin agonist	0.25	0.17	0.23	0.32	0.25	0.28
Alpha-glucosidase inhibitors	0.02	0.02	0.06	0.08	0.02	0.02
Glucagon-like peptide-1 agonists	0.75	0.81	0.85	0.80	0.76	0.99
Sulfonylurea/TZD combination	0.08	0.08	0.11	0.02	0.21	0.23
Metformin/sulfonylurea combination	2.45	1.91	2.73	2.60	2.45	2.33
TZD/metformin combination	0.58	0.51	0.40	0.27	0.83	0.90
DPP-4 inhibitors	2.54	3.15	2.96	3.17	3.57	4.62
DPP-4 inhibitor/metformin combination	0.62	0.64	0.49	0.55	0.70	1.05

DPP-4 indicates dipeptidyl peptidase-4; TZD, thiazolidinedione.
[a]Market share by class was calculated by using this formula: (sum of days of supply for each subclass of diabetes medications) / (sum of days of supply for all diabetes medications).

patients' adherence to their diabetes medications. The reason may be that brand-name medications play a critical role in the treatment of diabetes. Currently, thiazolidinediones (TZDs), glucagon-like peptide-1 (GLP-1) agonists, dipeptidyl peptidase-4 inhibitors, and insulin are predominately brand-name medications, whereas generic substitutions are readily available for metformin and sulfonylureas. The current type 2 diabetes treatment algorithm from the American Diabetes Association and the European Association for the Study of Diabetes recommends metformin for first-line pharmacotherapy. If patients cannot lower their A1C to 7% or below within the first 2-3 months, then they need to upgrade to combination medications such as metformin + basal insulin, metformin + sulfonylurea, metformin + TZD, or metformin + GLP-1 agonist. If patients still cannot reach their A1C goal, metformin + intensive insulin should be considered.[21] Because many patients with diabetes in Part D are senior citizens, most of them may have progressed beyond the first-line pharmacotherapy treatment and need brand-name medications including TZD, GLP-1 agonists, and insulin to maintain A1C control. Consequently, the lack of coverage for brand-name medications has a large impact on the treatment of diabetes.

This research has several limitations. First, this research is based on data from 1 pharmacy benefit management company and the findings may not be necessarily generalized to other populations. Second, this analysis relies exclusively on pharmacy claim data. Although pharmacy claim data are useful to examine medication adherence, we cannot examine the potential impact of coverage gap on other important clinical outcomes such as A1C level and diabetes-related hospitalizations. In addition, we cannot differentiate type 1 and type 2 diabetes because of the lack of medical claim data. Data on duration of diabetes also are not available. Third, adherence to diabetes medication is only part of diabetes management. The impact of the donut hole on other aspects of diabetes management such as self-management is unclear. Further analysis is needed to understand the effect of coverage gap on hospitalization risks and A1C control for Part D beneficiaries with diabetes.

CONCLUSIONS

This research found that Part D patients without coverage of brand-name medications experienced substantial increase in copayments for diabetes medications and substantial decrease in adherence to diabetes medication in the coverage gap. The coverage of brand-name medications was critical for patients to maintain adherence in the donut hole. The findings in this research supported the recently passed healthcare

■ **Table 5.** Logistic Regression Analysis: PDC Dummy (≥0.8)

Variable	Coefficient	*P* value	Odds Ratio	
			Point Estimate	95% Confidence Interval
Intercept	2.096	<.0001		
In DH	−0.009	.8486	0.991	0.902, 1.088
Group (reference: full coverage in DH)				
No coverage in DH	−0.191	.0025	0.826	0.730, 0.935
Generic drug coverage only in DH	−0.231	<.0001	0.794	0.710, 0.888
Coverage effects (group and DH interactions)				
No coverage in DH x in DH (no coverage effect)	−0.483	<.0001	0.617	0.523, 0.728
Generic drug coverage only in DH x in DH (generic coverage effect)	−0.354	<.0001	0.702	0.604, 0.816
Male	0.115	.0010	1.122	1.048, 1.202
Age group (reference: 65-74 y)				
75-84 y	−0.177	<.0001	0.838	0.782, 0.898
≥85 y	−0.291	<.0001	0.747	0.669, 0.836
Ever used insulin in 2007	−0.36	<.0001	0.698	0.653, 0.746
Region of residence (reference: Midwest)				
Northeast	0.113	.1613	1.119	0.956, 1.311
South	−0.236	.0008	0.790	0.688, 0.906
West	0.226	.0007	1.253	1.100, 1.428
RxRisk comorbidity groups				
Anxiety and tension	−0.132	.0025	0.876	0.805, 0.955
Cardiac disease	0.094	.0950	1.099	0.984, 1.227
Coronary/peripheral vascular disease	−0.299	<.0001	0.741	0.690, 0.796
Cystic fibrosis	−0.178	.0002	0.837	0.763, 0.919
Depression	−0.211	<.0001	0.810	0.751, 0.873
Epilepsy	−0.186	<.0001	0.831	0.757, 0.911
Gastric acid disorder	−0.179	<.0001	0.836	0.78, 0.897
Glaucoma	−0.100	.0487	0.904	0.819, 0.999
Heart disease/hypertension	−0.065	.0843	0.937	0.870, 1.009
Hyperlipidemia	0.172	<.0001	1.188	1.095, 1.288
Hypertension	0.026	.6117	1.026	0.929, 1.134
Irritable bowel syndrome	−0.183	.0002	0.833	0.758, 0.916
Malignancies	−0.021	.7338	0.979	0.869, 1.104
Thyroid disorder	−0.056	.1642	0.946	0.875, 1.023
Sample size			25,762	
Likelihood ratio test ($P > \chi 2$)			<.0001	
Test: effect 1 = effect 2 ($P > \chi 2$)			0.1586	

DH indicates donut hole; PDC, proportion of days covered.

reform on Part D coverage gap.[22] Starting from 2011, Part D will provide a 50% discount on brand-name medication costs in the coverage gap. New legislations will provide additional discounts in the coverage gap each year through 2020, when the donut hole will be closed completely. In 2014, copayment for brand-name medications in the coverage gap will be further reduced until it reaches 25% in 2020. Copayment for generic medications in the coverage gap will also begin to gradually decrease by 7% in 2011 until it reaches 25% in 2020. These reform measures should help improve adherence for Part D patients with diabetes.

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